

ABSTRACT

Chlorine, a common chemical disinfectant is used at NamWater Treatment Plants. Though chlorine has been shown to be a very effective disinfectant, its increased use (in high dosages), dictated by the increase in the load of microorganisms in the water to be subjected to treatment, leads to an increase in hazardous carcinogenic by-products. In this study, BioSprite technology, which makes use of silver-copper-zinc ionization to treat water, was investigated as a secondary disinfectant to augment existing chlorine treatment at the Windhoek Airport Water Scheme. The ultimate objective was to reduce the number of microorganisms in treated water by reducing the chlorine demand and saving on chlorine usage. Water samples for incoming, treated and outgoing water were collected for field testing of residual chlorine and for laboratory analyses of chemical and microbiological parameters. The water sampling was done prior to the use of BioSprite and during the trial. Adjustments to the chlorine dosing was made with the conjunctive use of BioSprite by lowering the initial dose of 100 g/hr at the start of the trial to 50 g/hr, then finally to 25 g/hr; while maintaining residual chlorine levels within standard limits of 3 mg/l during most of the study period. Heterotrophic plate count (HPC) and coliform bacteria were determined through microbiological analyses to give an indication of the presence of heterotrophic microorganisms and pathogens. Prior to BioSprite use, the average HPC in the Ground Reservoir, where the dosing takes place was 42.63; and later 1.44. Only 1 count of total coliform was detected in product water at the customer point towards the end of the trial. The chlorine dosage changes translated to savings of 2.00 mg/l at the end of the study. The use of BioSprite was thus found to be effective in reducing the number of microorganisms in treated water and lowering the chlorine demand. Conjunctive use of BioSprite with chlorine will however, lead to an increase in the cost of treatment.

Key words: BioSprite, disinfection, heterotrophic plate count, silver-copper-zinc ionization